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REMARKS

This is intended as a full and complete response to the Office Action dated October 7, 2003, having a shortened statutory period for response set to expire on January 7, 2004. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1, 4-14, 16-24, and 26-34 remain pending in the application and are shown above. Claims 1, 4-7, 10-14, 20-24, 28-29, and 31-33 stand rejected. Claims 8-9, 16-19, 26-27, 30, and 34 stand objected to by the Examiner. Applicants have amended claims 1, 9, 14, 18, and 29 to correct informalities. Since no narrowing amendment has been made, Applicants assert that the claims are entitled to the full scope of equivalents.

35 U.S.C. §102 Rejections

Claims 1 and 4-6 are not anticipated by *Gabe et al.* under 35 U.S.C. §102(e)

Claim 1 and 4-6 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Gabe et al.*, U.S. Patent Application Publication No. 2003/0102226 A1. The Examiner asserts that *Gabe et al.* discloses the elements of claims 1 and 4-6. Applicants respectfully traverse the rejection on grounds that *Gabe et al.* discloses a metal plating bath containing alcohol compounds that inhibit or retard the consumption of plating bath additives to improve the brightness of the plated metal. (See, Abstract.) *Gabe et al.* does not teach, show, or suggest electroplating solutions having anti-oxidants therein which combine with free radicals in the electroplating solution to thereby reduce the number of free radicals combining with organic additives.

In addition, as evidenced by the attached declaration of an inventor of the present Application (Exhibit A), the invention of independent claims 1, 11, 20, and 29 was conceived prior to the relevant reference date, and diligently reduced to practice. *Gabe et al.* was filed on October 2, 2001. As the Examiner's rejection is based upon 35 U.S.C. § 102(e), the filing date of *Gabe et al.* is the relevant reference date. All dates in Exhibit A prior to the relevant reference date have been masked. Personal information about the employees of the assignee has also been masked. The declaration obviates

the rejection and places the claims in condition for allowance. Withdrawal of the rejection and allowance of the claims are respectfully requested.

Claims 11 and 13-14 are not anticipated by *Gabe et al.* under 35 U.S.C. §102(e)

Claim 11 and 13-14 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Gabe et al.* The Examiner asserts that *Gabe et al.* discloses the elements of the recited claim 11 and 13-14. Applicants respectfully traverse the rejection.

As evidenced by the attached declaration of an inventor of the present Application (Exhibit A), the invention of independent claims 1, 11, 20, and 29 was conceived prior to the relevant reference date of *Gabe et al.*, and diligently reduced to practice. Therefore, withdrawal of the rejection and allowance of the claims are respectfully requested.

Claims 20-24 and 28 are not anticipated by *Gabe et al.* under 35 U.S.C. §102(e)

Claim 20-24 and 28 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Gabe et al.* The Examiner asserts that *Gabe et al.* discloses the elements of the recited claim 20-24 and 28. Applicants respectfully traverse the rejection.

As evidenced by the attached declaration of an inventor of the present Application (Exhibit A), the invention of independent claims 1, 11, 20, and 29 was conceived prior to the relevant reference date of *Gabe et al.*, and diligently reduced to practice. Therefore, withdrawal of the rejection and allowance of the claims are respectfully requested.

35 U.S.C. §103 Rejections

Claims 7 and 10 are patentable over *Gabe et al.* under 35 U.S.C. §103(a)

Claims 7 and 10 stand rejected under 35 U.S.C. § 103(a) as being obvious over *Gabe et al.* Applicants respectfully traverse the rejection.

As evidenced by the attached declaration of an inventor of the present Application (Exhibit A), the invention of independent claims 1, 11, 20, and 29 was conceived prior to the relevant reference date of *Gabe et al.*, and diligently reduced to practice. Therefore, withdrawal of the rejection and allowance of the claims are respectfully requested.

Claim 12 is patentable over *Gabe et al.* under 35 U.S.C. §103(a)

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being obvious over *Gabe et al.* Applicants respectfully traverse the rejection.

As evidenced by the attached declaration of an inventor of the present Application (Exhibit A), the invention of independent claims 1, 11, 20, and 29 was conceived prior to the relevant reference date of *Gabe et al.*, and diligently reduced to practice. Therefore, withdrawal of the rejection and allowance of the claims are respectfully requested.

Claims 29 and 31-32 are not obvious over *Naoi et al.* under 35 U.S.C. §103(a)

Claims 29 and 31-32 stand rejected under 35 U.S.C. § 103(a) as being obvious over *Naoi et al.* (U.S. Patent Application Publication No. 2003/0059634). The Examiner states that one skilled in the art would calculate the concentration to replenish the amount of sodium stannate depleted in the plating process. Applicants respectfully traverse the rejection.

Naoi et al. discloses a method for producing a personal ornament having a white outermost layer. The method of *Naoi et al.* includes forming a base layer, forming a plating layer, and forming a coating layer. The materials to be deposited as the plating layer may be gold, titanium, titanium carbide, copper, copper-tin, copper-tin-zinc alloy, palladium, copper-tin-palladium alloy, or nickel. (See, Abstract and paragraphs 64-94.) *Naoi et al.* further discloses that, for depositing a copper-tin alloy plating layer (Cu-Sn-Zn metal alloy), sodium stannate (Na_2SnO_3), together with copper cyanide ($\text{Cu}(\text{CN})_2$) and zinc cyanide ($\text{Zn}(\text{CN})_2$), can be used as bulk materials. (See, paragraphs 359-366.) The ratio of the initial concentrations of copper cyanide, sodium stannate, and zinc cyanide determines the final alloy metal ratio of Cu: Sn: Zn to be deposited, respectively. (See, paragraphs 359-429.) As one example, 15 g/L of copper cyanide, 15 g/L of sodium stannate, and 1 g/L of zinc cyanide in terms of Cu, Sn, and Zn are used in the plating solution for an alloy metal ratio of Cu: Sn: Zn of 75%: 20%: 5%, respectively. As another example, 8.5 g/L of copper cyanide, 34 g/L of sodium stannate, and 1 g/L of

zinc cyanide in terms of Cu, Sn, and Zn, are used in the plating solution for an alloy metal ratio of Cu: Sn: Zn of 50%: 35%: 15%, respectively.

Thus, the amount of sodium stannate required in *Naoi et al.* is a high sodium stannate concentration for deposition and is added in a fixed and pre-determined amount. Therefore, *Naoi et al.* does not teach, show, or suggest adding sodium stannate to a plating solution to reduce degradation of organic plating additives in a time varying amount. *Naoi et al.* does not teach, show, or suggest varying nor replenishing the amount of sodium stannate added in the plating solution during electrochemical plating process, since doing so will alter the final ratio of deposited metal alloy that is desired and the property of the deposited copper-tin alloy layer.

Contrary to the Examiner's statement at page 7 of the office action, claims 29 and 31-32 do not require replenishing the amount of sodium stannate in the amount of the sodium stannate depleted, but in an amount required for reducing degradation of organic plating additives. Specifically, *Naoi et al.* does not teach, show, or suggest a method for reducing degradation of organic plating additives in an electrochemical plating solution, comprising adding sodium stannate to the electrochemical plating solution, the sodium stannate being added in an amount corresponding to a time varying amount of degraded organic plating additives (not sodium stannate) generated in the electrochemical plating solution, as recited in claim 29, and claims dependent thereon. Further, there is no motivation or suggestion in *Naoi et al.* or generally in the prior art to use sodium stannate in an amount corresponding to a time varying amount of degraded organic plating additives generated. Therefore, withdrawal of the rejection and allowance of the claims are respectfully requested.


Claim 33 is patentable over *Naoi et al.* under 35 U.S.C. §103(a)

Claim 33 stands rejected under 35 U.S.C. § 103(a) as being obvious over *Naoi et al.* as applied to claims 29 and 31-32 above. The Examiner states that *Naoi et al.* teaches a electrochemical plating solution which includes an acid of amidosulfonic acid in a concentration of between about 5 g/l and about 200 g/l. Applicants respectfully traverse the rejection.

Naoi et al. is discussed above. Claim 33 depends from claim 29, which has been distinguished above. As discussed above, *Naoi et al.* does not teach, show, or suggest a method for reducing degradation of organic plating additives in an electrochemical plating solution, comprising adding sodium stannate to the electrochemical plating solution, the sodium stannate being added in an amount corresponding to a time varying amount of degraded organic plating additives (not sodium stannate) generated in the electrochemical plating solution, wherein the electrochemical plating solution includes an acid in a concentration of between about 5 g/l and about 200 g/l, as recited in claim 33. Therefore, withdrawal of the rejection and allowance of claim 33 are respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the methods and compositions of the present invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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